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13. ABSTRACT (Maximum 200 words) Diketonate Schiff-base complexes were investigated, and the square planar derivatives (M=Ni, Cu, Pd) were found to display discotic hexagonal disordered phases (D_{hd}). The M=VO analogs are not liquid crystalline. None of the complexes can exhibit a disc-shape independently, and in the mesophase they must organize into a superstructure which on time average leads to antiparallel alignment of nearest neighbors. These discotic antiphases exhibit a number of important properties including low melting points, low viscosity, and close intermolecular contacts of 3.6Å. Additionally when put between two untreated slides, these mesophases were found to readily align with the column axes perpendicular to the surfaces. The Cu and Ni complexes exhibited very similar mesophases and lattice constants whereas the Pd complexes displayed larger intercolumnar distances and higher clearing temperatures. The differences are ascribed to greater intermolecular associations displayed by the Pd complexes. X-ray diffraction studies revealed the Ni and the Cu complexes to have an additional halo centered at $\sim 7.2\text{\AA}$ which may be the result of a doubling of the period along the column axes resulting from the antiparallel arrangement of the antiphase superstructure.					
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Chemistry of Materials in press

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Transition Metals in Highly Correlated Discotic Phases: Designing Metallomesogens With Selected Intermolecular Organizations

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Abstract:

The diketonate Schiff-base complexes shown below were investigated, and the square planar derivatives ($M=\text{Ni}$, Cu , Pd) were found to display discotic hexagonal disordered phases (D_{hd}). The $M=\text{VO}$ analogs are not liquid crystalline. None of the complexes can exhibit a disc-shape independently, and in the mesophase they must organize into a superstructure which on time average leads to antiparallel alignment of nearest neighbors. These discotic antiphases exhibit a number of important properties including low melting points, low viscosity, and close intermolecular contacts of 3.6\AA . Additionally when put between two untreated slides, these mesophases were found to readily align with the column axes perpendicular to the surfaces. The Cu and Ni complexes exhibited very similar mesophases and lattice constants whereas the Pd complexes displayed larger intercolumnar distances and higher clearing temperatures. The differences are ascribed to greater intermolecular associations displayed by the Pd complexes. X-ray diffraction studies revealed the Ni and the Cu complexes to have an additional halo centered at $\sim 7.2\text{\AA}$ which may be the result of a doubling of the period along the column axes resulting from the antiparallel arrangement of the antiphase superstructure.

